12 Lead ECGs: Bundle Branch Blocks & Hemiblocks

Hemiblocks & Bundle Branch Blocks

- Value
  - Help to identify patients at high risk for complete heart block
    - Hemiblocks, Bundle branch blocks and AV blocks are precursors to complete heart block
  - You are Alert & Better Prepared!!!

Anatomy Review

- Anatomy
  - Bundle of His
  - Left Bundle Branch
    - Anterior fascicle
      - long, thin; only blood supply from LAD
    - Posterior fascicle
      - shorter, thick; blood supply from RCA and LCX
  - Right Bundle Branch

Definitions

- Hemiblock
  - Also called fascicular blocks
  - block in one of the two fascicles of the left bundle branch
- Bundle Branch Block
  - block of the **entire** left or right bundle branch

Hemiblocks

- Posterior fascicle
  - Much more difficult to have block ➔ greater disease
  - Less common but more concerning
  - Supplies majority of inferior wall of LV
  - If blocked, results in right axis deviation

Hemiblocks

- Anterior fascicle
  - Easier to have block; More common
  - Supplies superior wall of LV
  - If blocked, results in pathologic left axis deviation

Hemiblock Identification

- Left Anterior Hemiblock
  - ***Pathologic Left Axis Deviation***
    - small q wave in lead I
    - small r wave in lead III
  - ***Normal QRS or RBBB***
- Left Posterior Hemiblock
  - ***Right Axis Deviation***
    - small r wave in lead I
    - small q wave in lead III
  - ***Normal QRS or RBBB***
    - usually does have RBBB
  - "absence of right ventricular hypertrophy"

Precursors to Complete Heart Block

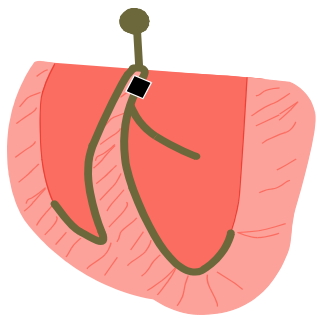
- ***Any Type II AV Block***
- ***Anyone with disease of both bundles***
- ***Anyone with two or more of any blocks***
- Examples:
  - Prolonged P-R & anterior hemiblock
  - RBBB & anterior hemiblock
  - RBBB & posterior hemiblock
  - Prolonged P-R with anterior hemiblock & RBBB

Precursors to Complete Heart Block

- If recognize precursors to CHB, then:
  - Have high index of suspicion for CHB
  - Have TCP ready (standby mode)
  - Patient may need a pacemaker
  - Administration of Lidocaine and other ventricular antidysrhythmics may result in CHB
    - Lidocaine contraindicated in patients with precursors to CHB unless TCP in place and ready

Bundle Branch Block

- Can be pre-existing condition
- Can be caused by ACS
- If AMI caused
  - 60-70% associated with pump failure
  - 40-60% mortality w/o reperfusion



Bundle Branch Block

Can Mimic or Hide Evidence Needed to Identify AMI

- May Produce
  - ST elevation
  - ST depression
  - Tall T waves
  - Inverted T waves
  - Wide Q waves
- May Hide
  - ST elevation
  - ST depression
  - Tall T waves
  - Inverted T waves
  - Wide Q waves

BBB Problem

- BBB Problem
  - Critical to reperfuse patients with BBB produced by ACS
  - ACS “harder” to identify on ECG when BBB present
  - New or presumably new BBB is an indication for thrombolytic therapy

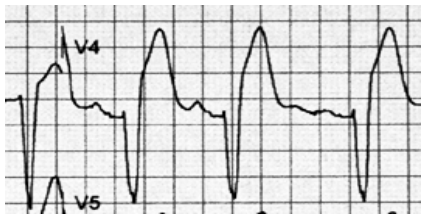
BBB Recognition

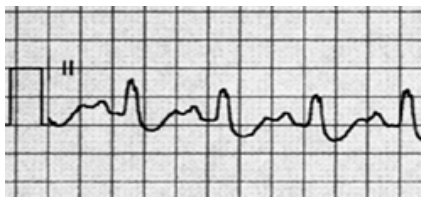
Forget About the Notch!

BBB Recognition

- **Fundamental Criteria**
  - Wide QRS
    - > 100 ms (or, 0.10 sec)
  - Supraventricular rhythm

BBB Recognition



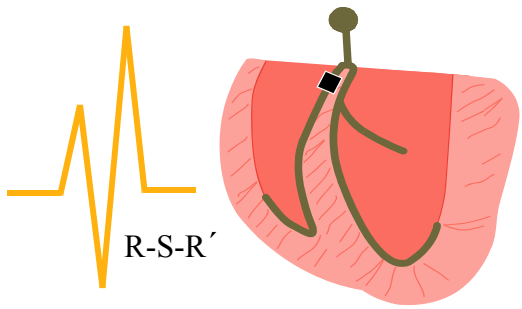


Normal Ventricular Conduction

- Normal Conduction
  - fibers of LBB begin conduction
  - impulse travels across interventricular septum from left to right
    - towards + electrode creates small r wave
  - travels across ventricles causing depolarization of both simultaneously
    - LV contributes most to complex
  - impulse travels away from + electrode creates primarily negative complex

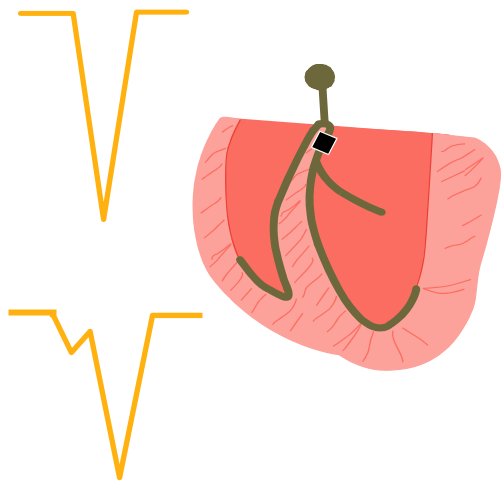
RBBB

- RBBB in V1
  - no change in initial impulse travel
    - small r wave
  - impulse depolarizes LV by itself since RBBB
  - RV depolarized by impulse thru muscle
    - it now contributes to complex
  - travels toward + electrode creating positive deflection



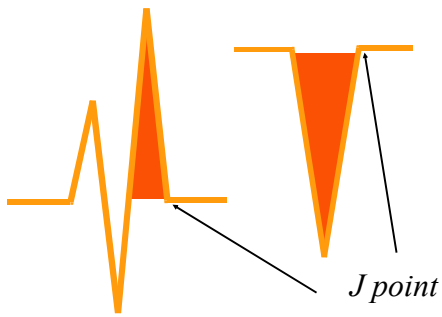
LBBB

- LBBB in V1
  - initial deflection altered since travels right to left now
    - Q wave or small q wave
  - RV depolarizes unopposed
    - may produce small r wave
  - travels across septum to depolarize LV
    - deep S wave



BBB Recognition

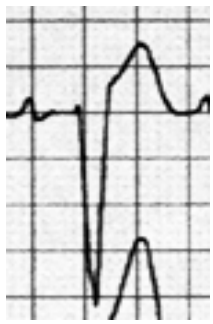
- Terminal Force in V1
  - direction of deflection prior to J point

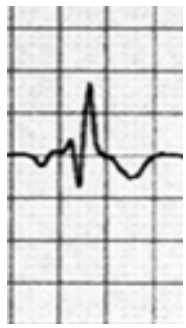


BBB Recognition

- Use V1
- Find Terminal force
- Identify direction of terminal force
  - Downward ➔ LBBB
  - Upward ➔ RBBB
- Picture a Steering Wheel
  - Right turn ➤ turn signal goes up
  - Left turn ➤ turn signal goes down

BBB Recognition Practice





BBB Recognition Practice